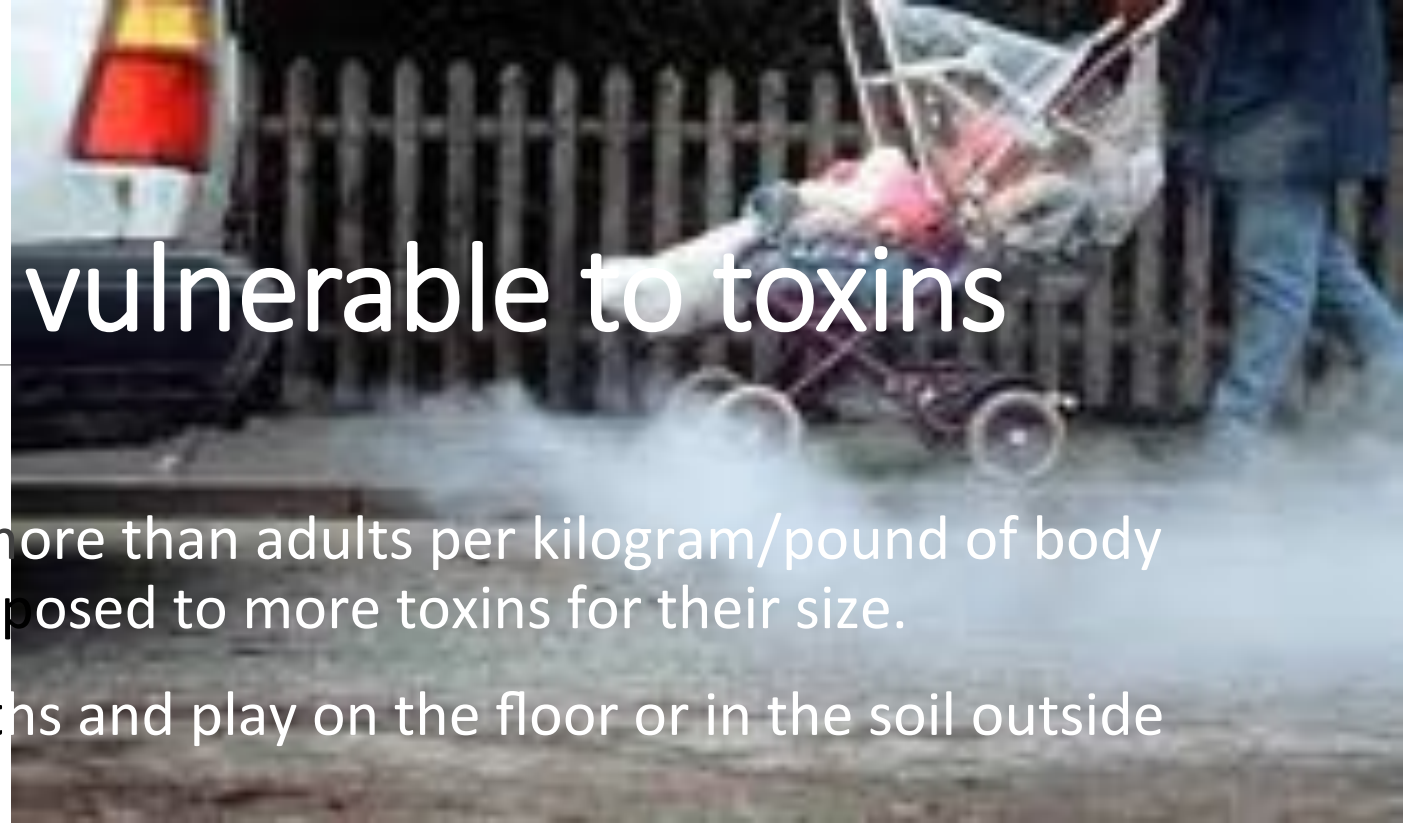
Children's Health - Why the Environment Matters

SUE DEMPSEY, MS

NDHHS

Children are more vulnerable to toxins



- Children eat, drink, and breathe more than adults per kilogram/pound of body weight, in other words, they are exposed to more toxins for their size.
- Children put objects in their mouths and play on the floor or in the soil outside exposing them to greater risk.
- Immune processes that address chemicals in the body aren't fully developed yet in children (absorption, distribution, metabolize and excretion).
- Developmental processes in utero and in those of small children are more sensitive to toxin exposure.

By protecting children, we may also improve their health as adults. Most scientists agree that ***both the environment and genetics play a role*** *in the development of disease and disorders, and since we can't change our genes,* ***identifying and managing exposure to environmental toxins offers the best hope for prevention****.*

Children are more vulnerable to toxins

- Environmental health researchers now recognize that **low level exposures**, especially **during early developmental growth periods**, such as *in utero* or neonatal, **can have long-lasting effects**.
- Research evolution demonstrates that environmental health effects are complex—not a simple relationship between a particular type and amount of exposure and disease and that **combined chemical exposures affect growth and development in ways not previously recognized**.

Disease and disorders with environmental components

- Asthma and allergies
- Autism
- Cancer
- Childhood obesity
- Epigenetic mechanisms
- **Neurodevelopmental disorders**

Neurodevelopmental Disorders
Polyaromatic Hydrocarbons (PAHs)

PAHs *- a group of ~100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat.*

- Prenatal exposure to PAHs showed **reduced birth weight and head circumference** in African-American babies born to women who were highly exposed to air pollutants. (Perera et al., 2003).

- Children with high prenatal exposure to PAHs had significantly **lower test scores** at age 3 on the Bayley test for **cognitive development** and were more likely to be **developmentally delayed** (Perera et al., 2006).

Neurodevelopmental Disorders
Chlorpyrifos and Diazinon (Insecticides)

Chlorpyrifos *is used to control termites, roaches, mosquitos, lice, grubs, cut-worms, and corn rootworms.*

Diazinon *is used to control roaches, ants, silverfish, and fleas.*

- Prenatal exposure to chlorpyrifos and diazinon **reduced birth weight** by an average of 6.6 ounces - the equivalent weight reduction seen in babies born to women who smoked (Whyatt et al., 2004).
- Children prenatally exposed to high levels of chlorpyrifos experienced **delays in both psychomotor and cognitive development**, manifested symptoms of **ADHD**, and **pervasive developmental disorders** at age 3.
- Although the EPA banned residential use of chlorpyrifos in 2001, this pesticide is still widely used in agriculture (Rauh et al., 2006).

Neurodevelopmental Disorders
Lead

Lead *- Human activity from mining, burning fossil fuels and manufacturing has caused it to become more widespread. Lead was also once a key ingredient in paint and gasoline and is still used in batteries, solder, pipes, pottery, roofing materials and some cosmetics.*

- Lead exposure **impairs brain development** and **interferes with neurotransmitter systems** (Reyes 2015).
- Previous research has linked the biochemical and neurological effects of lead exposure to **impulsivity, behavioral problems, hyperactivity, and impaired cognition**, all of which are associated with crime.
- Cecil et al. (2008) find that childhood blood lead is negatively correlated with adult brain volume in regions associated with executive function, **ADHD, and childhood behavioral problems**.

Neurodevelopmental Disorders
Lead

- Lead's effect on impulse control stems in part from its **ability to mimic calcium**, which activates and mediates the transmission of nerve signals (Troesken 2006).

Lead's effects on nerve conduction," writes Troesken, *"could help explain the finding that **lead levels are four times higher among convicted juvenile offenders** than among non-delinquent high school students."*

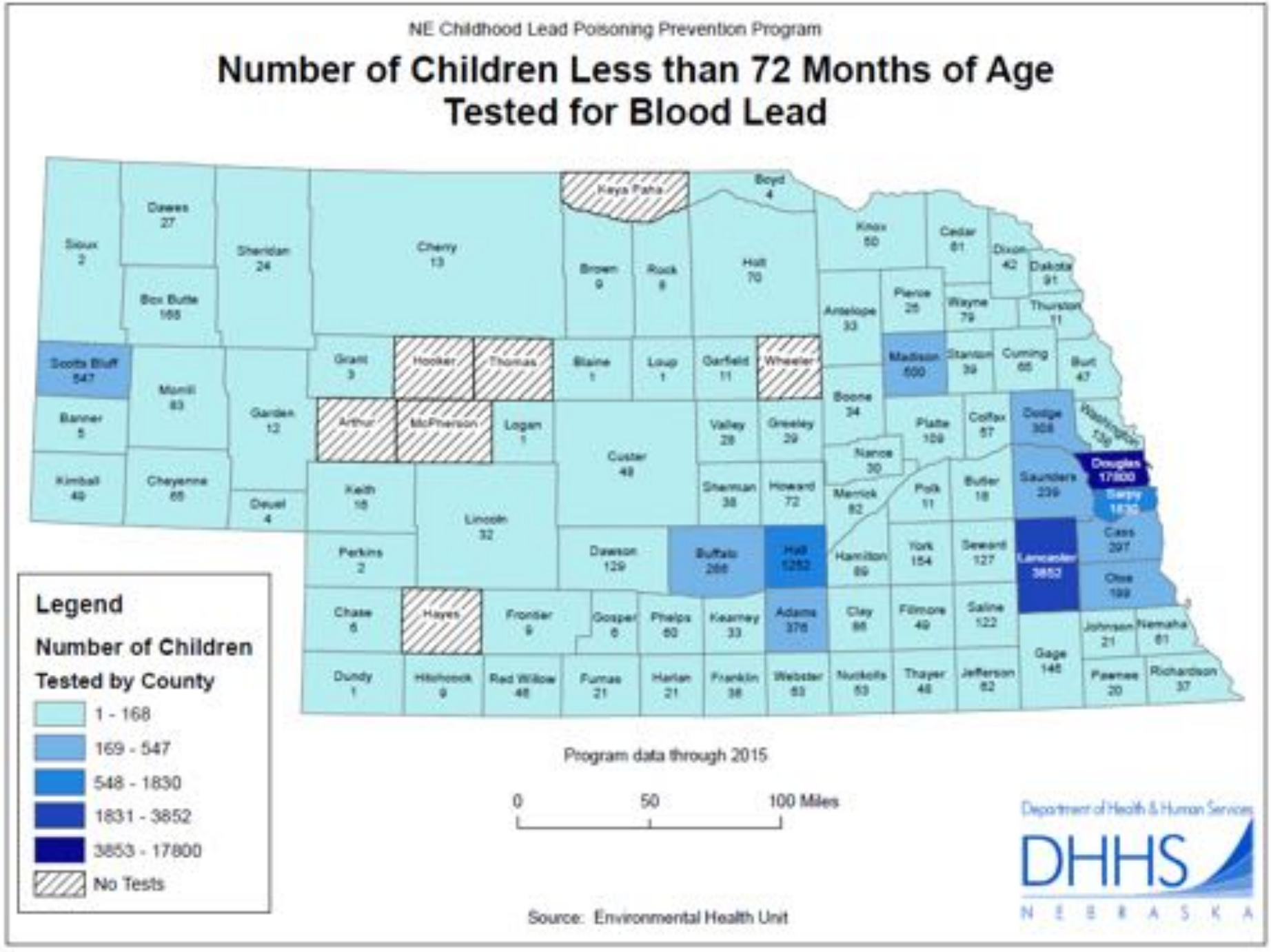
- Needleman et al. (1996), X-rayed the bones of 212 boys in Pittsburgh, finding that boys with high bone lead measurements exhibited **more delinquent, aggressive, internalizing, and externalizing behavior** than otherwise similar boys. Burns et al. (1999) replicated these findings in a study of children in Australia.

Neurodevelopmental Disorders
Lead

- A large body of literature connects lead exposure to **ADHD** (Goodlad et al. 2013). Braun et al. (2006), documenting significant dose-response relationships between childhood **lead exposure and ADHD**.
- Mendelsohn et al. (1998) and Nigg et al. (2010) report a positive association between blood lead and **hyperactivity, distractibility, and low frustration tolerance** in very young children.
- **Children with ADHD, particularly those who exhibit early behavioral problems, are more likely than comparable children to become involved in crime** (Moffitt 1990).

Neurodevelopmental Disorders
Lead

- Several studies report a negative relationship between lead exposure and **IQ scores**, with **no evidence of a threshold below which lead exposure does not affect cognition** (Needleman and Gatsonis 1990; Bellinger et al. 1992; Pocock et al. 1994; Schwartz 1994; Lanphear et al. 2000; Canfield et al. 2003; Lanphear et al. 2005).
- *"IQ scores are strongly related to the cluster of neuropsychological abilities known as 'executive functions,' whose impairment will produce* ***an inattentive, impulsive child who has difficulty considering the future implications of his or her acts****"* (Lynam et al. 1993). Lyman study suggests that measures of IQ may indirectly capture the effects of impulse control on crime.
- A large body of experimental literature on non-human animals has yielded results consistent with those reported in observational studies of humans.

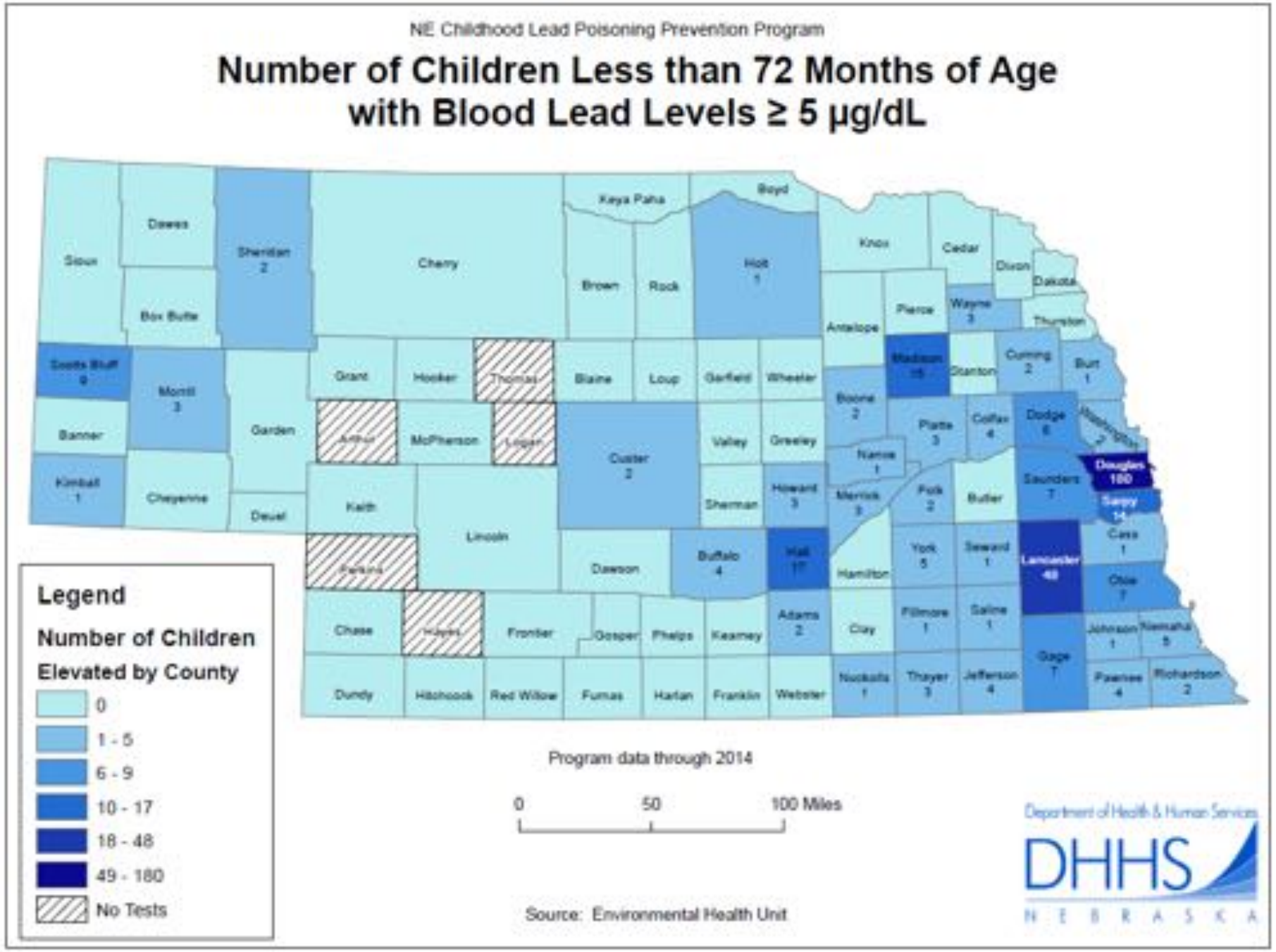

NE Childhood Lead Poisoning Prevention Program
Number of Children Less than 72 Months of Age Tested for Blood Lead
Legend
Number of Children Tested by County
1 - 168
169 - 547
548 - 1830
1831 - 3852
3853 - 17800
No Tests
Program data through 2015
0
50
100 Miles
Source: Environmental Health Unit
Department of Health & Human Services
DHHS
NEBRASKA

Nebraska DHHS Division of Public Health/Childhood Lead Poisoning Prevention Program

Statewide Blood Lead Risk Assessment/Blood Lead Testing Plan

Three Criteria for Testing a Child for Lead Poisoning	Specifics for Each Criterion
CRITERION 1 **GEOGRAPHY** All Children Living in One of Nebraska's Targeted Communities for Lead Assessment/Testing	Alliance – 69301 Beatrice – 68310 Central City – 68826 Columbus – 68601 Fairbury – 68352 Fremont – 68025 Grand Island – 68801, 68803 Hastings – 68901 Lincoln – 68502, 68503, 68504, 68507, 68508, 68510, 68521 Nebraska City – 68410 Norfolk – 68701 Omaha – 68102, 68104, 68105, 68106, 68107, 68108, 68110, 68111, 68112, 68131, 68132 Schuyler – 68661 Scottsbluff – 69361 York – 68467 DHHS strongly recommends that all children living in these communities be tested for lead poisoning at 12 and 24 months of age. Children between 25 and 72 months of age need to be tested as soon as possible, if not previously tested. *Please note that targeted communities may change as more blood lead data is obtained. Zip codes will be re-evaluated annually and posted at www.dhhs.ne.gov/lead.*
CRITERION 2 **MEDICAID AND WIC** *Medicaid:* ALL CHILDREN INSURED BY MEDICAID MUST BE TESTED—NO EXCEPTIONS OR WAIVERS EXIST.	*Medicaid:* CMS (Centers for Medicare and Medicaid Services) requires that all children receive a screening blood lead test at 12 months and 24 months of age. Children between the ages of 36 months and 72 months of age must receive a screening blood lead test if they have not been previously screened for lead poisoning. A blood lead test must be used when screening Medicaid-eligible children. (http://www.cms.gov/MedicaidEarlyPeriodicScreen/) (http://www.sos.ne.gov/rules-and-regs/regsearch/Rules/Health_and_Human_Services_System/Title-471/Chapter-33.pdf)
WIC: Federal Policy (MPSF:WC-01-05-P) requires that upon enrollment of a child, the parent must be asked if the child has had a blood lead test. If the child has not had a test, they must be referred to programs where they can obtain such a test	*WIC:* For every child age 12 months and older, during the Nutrition Risk Assessment, WIC staff will ask the question "Has your child had a blood lead test done in the past 12 months?" Document the Yes or No response. If a child has not had a blood lead test done, staff make and document a referral for a blood lead test back to their healthcare provider or to a lead screening program.
CRITERION 3 **QUESTIONNAIRE** **For** **Children NOT Enrolled in Medicaid or WIC** **And** **Children NOT Residing within a Target Community** The child's parents/guardians should be asked specific exposure questions (see questions at right) to determine each child's risk. If the response to any of the exposure questions is "yes" or "don't know," the child should be tested.	**QUESTIONNAIRE** 1) Does the child live in or often visit a house, daycare, preschool, home of a relative, etc., built before 1950? 2) Does the child live in or often visit a house built before 1978 that has been remodeled within the last year? 3) Does the child have a brother, sister or playmate with lead poisoning? 4) Does the child live with an adult whose job or hobby involves lead? 5) Does the child's family use any home remedies or cultural practices that may contain or use lead? 6) Is the child included in a special population group, i.e., foreign adoptee, refugee, migrant, immigrant, foster care child? *For additional information, i.e. jobs, hobbies, home remedies, cultural practices that include lead, visit dhhs.ne.gov/lead*

11/2015


NE Childhood Lead Poisoning Prevention Program
Number of Children Less than 72 Months of Age with Blood Lead Levels ≥ 5 µg/dL
Legend
Number of Children Elevated by County
0
1 - 5
6 - 9
10 - 17
18 - 48
49 - 180
No Tests
Program data through 2014
0
50
100 Miles
Source: Environmental Health Unit
Department of Health & Human Services
DHHS
NEBRASKA

Neurodevelopmental Disorders
Mercury

(U.S. EPA 2016)

- Infants in the womb can be **exposed** to methylmercury when their **mothers eat fish and shellfish** that contain methylmercury.
- This exposure can **adversely affect unborn infants' growing brains and nervous systems**. These systems may be more vulnerable to methylmercury than the brains and nervous systems of adults.
- Children exposed to methylmercury while they are in the womb can have impacts to their:
  - **cognitive thinking**
  - **memory**
  - **attention**
  - **language**
  - **fine motor skills**
  - **visual spatial skills**

Neurodevelopmental Disorders
Methamphetamine

Prenatally meth-exposed children were found more likely to be **emotionally reactive, anxious, and depressed** at age 3 and they were more likely to show **aggressive behavior and symptoms of ADHD** at age 5.

"*Identifying meth-exposed children early on would be a big help*," the researcher stated, "*because it's much easier to correct behavior problems in preschoolers through parenting classes and other interventions than it is in older children. This is a time when you can really make a difference in children's lives*."

American Academy of Pediatrics (2012)

Neurodevelopmental Disorders
Methamphetamine

- Primary routes of exposure for young children include inhalation from second-hand smoke, accidental ingestion, skin absorption through direct contact, and food and beverage contamination.
- Children living in meth labs are at extremely high risk of a wide range of serious negative consequences including poisoning, homicides, and accidental deaths and burns due to home-based methamphetamine lab fires and explosions (El Paso Intelligence Center [EPIC] National Clandestine Laboratory Seizure System, 2004).
- Consequences of exposure to the toxic precursor chemicals can include poisoning, burns, and lung irritation; damage to the liver, kidneys, heart, brain, and immune system; cancers such as lymphoma and leukemia; bone marrow suppression resulting in anemia and increased risk of infections; and **developmental and growth problems** (Drug Endangered Children, 2000).

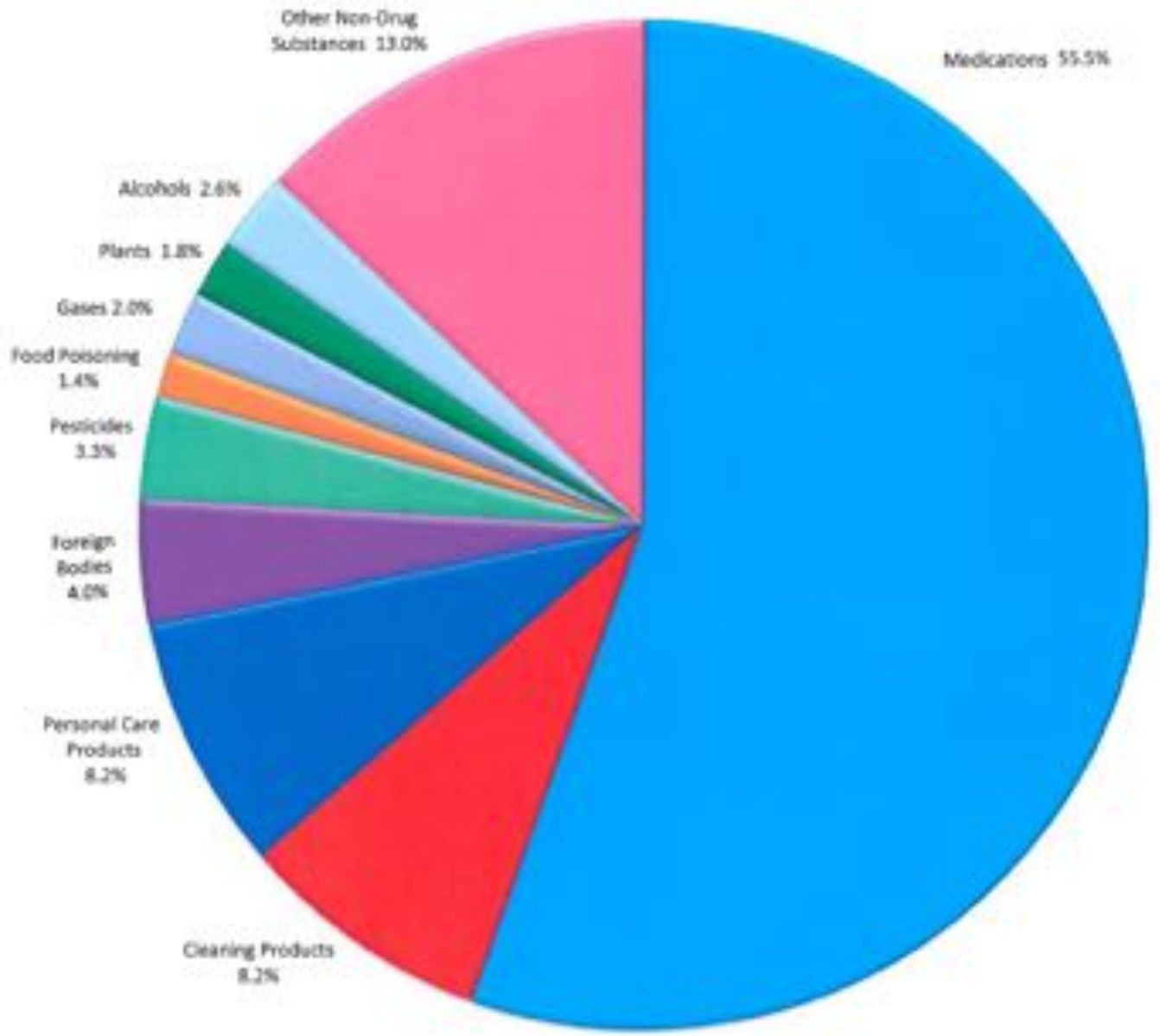
Neurodevelopmental Disorders
Methamphetamine

- Approximately **55% of children** removed from home-based methamphetamine labs **test positive** for toxic levels of chemicals in their bodies (Child Abuse Negl. 2014 Nov; 38(11): 1872-1883).

- **Children of drug-dependent parents are at high-risk to continue intergenerational patterns of drug abuse, criminal behaviors, and neglectful parenting** (Dunn et al., 2002, Greene, Haney, & Hurtado, 2000).

Neurodevelopmental Disorders
Methamphetamine

- Prenatal exposure to meth is associated with **an increase in premature delivery, complications during pregnancy, altered neonatal behavioral patterns (e.g., abnormal reflexes and extreme irritability), low birth weight, and smaller head circumference** (Hohman et al., 2004; Smith et al., 2003).
- Lester and associates (2006) found that effects of meth exposure differed with regard to specific trimesters. Exposure during the first trimester was related to more signs of **stress in infants**. Use during the second trimester was associated with more **lethargy in infants**. Use in the third trimester was related to **poorer quality of movement and greater physiological stress.**
- The risks that these children face also include the unknown incidence of physical and sexual abuse, **post-traumatic stress disorder (PTSD), neurological problems, and learning disabilities.**



NEBRASKA REGIONAL POISON CENTER

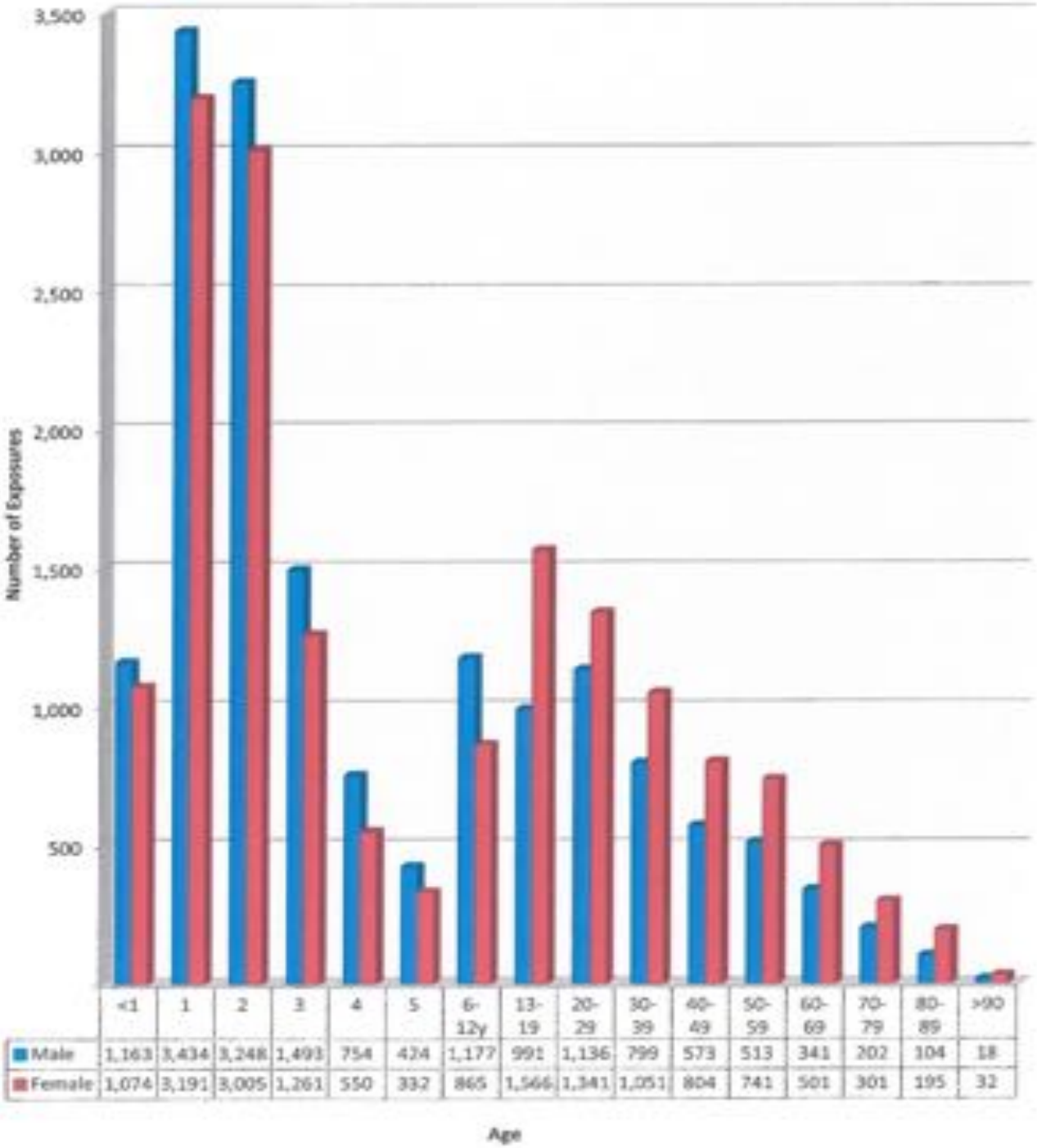
2014 Data

2014 Top Ten Substances: Non-Drug
Human Exposures

Substance	Number	% of Total
Cosmetics & Personal Care Products	**3431**	**8.2%**
Dental Care Products	497	
Creams, Lotions, & Make-up	420	
Nail Care Products	403	
Hand Sanitizer	403	
Deodorant	336	
Hair Care Products	275	
Soap	204	
Household Cleaning Products	**3427**	**8.2%**
Automatic Dishwasher Detergents	541	
Bleaches	538	
Wall/Tile/Floor Cleaners	391	
Miscellaneous Cleaners	369	
Laundry Products-Miscellaneous	311	
Single Unit	282	
Toilet Bowl Cleaners	225	
Foreign Bodies	**1676**	**4.0%**
Glow Products	378	
Desiccants	365	
Pesticides	**1374**	**3.3%**
Insecticides	751	
Herbicides	235	
Rodenticides	230	
Repellents	125	
Fungicides	29	
Alcohols	**1,082**	**2.6%**
Ethanol	854	
Isopropanol	158	
Gases	**848**	**2.0%**
Carbon Monoxide	363	
Chlorine and Chloramine Gas	228	
Methane and Natural Gas	86	
Propane/Simple asphyxiant	65	
Plants	**741**	**1.8%**
Oxylate Containing	132	
Non-toxic	106	
Amygdalin/Cyanogenic Glycoside	91	
Gastrointestinal Irritant	74	
Hydrocarbons	**607**	**1.5%**
Gasoline	183	
Fluorochlorocarbon/propellant	85	
Motor Oil/Lubrication oil	85	
Food Products/Poisoning	**584**	**1.4%**
Chemicals	**578**	**1.4%**
Acids	115	
Alkali	65	
Ammonia	43	

2014 Top Ten Substances: Drug
Human Exposures

Substance	Number	% Of Total
Analgesics	**4888**	**11.7%**
Acetaminophen (Alone & Combined With Other Drugs)	2137	
Ibuprofen	1547	
Opioids (Alone)	491	
Aspirin (Alone & Combined With Other Drugs)	304	
Sedative/Hypnotics/Antipsychotics	**1944**	**4.6%**
Benzodiazepines	936	
Atypical Antipsychotics	575	
Antidepressants	**1794**	**4.3%**
Selective Serotonin Reuptake Inhibitors	815	
Trazodone	297	
Tricyclics	168	
Bupropion	155	
Antihistamines	**1676**	**4.0%**
Diphenhydramine	722	
Topical Preparations	**1541**	**3.7%**
Diaper Care/Rash Products	574	
Camphor	238	
Topical Steroid	177	
Hydrogen Peroxide	151	
Cardiovascular Drugs	**1245**	**3.0%**
Beta Blockers	283	
ACE Inhibitors	202	
Antihyperlipidemics	171	
Clonidine	162	
Calcium Antagonists	114	
Vitamins	**1242**	**3.0%**
Multiple Vitamins	935	
Niacin and other B Vitamins	120	
Vitamin D	104	
Cold & Cough Preparations	**1110**	**2.7%**
Dextromethorphan (Alone & Combined With Other Drugs)	714	
Antihistamine/Decongestant (Combined With Other Drugs)	396	
Dietary Supplements/ Herbals/ Homeopathic	**986**	**2.4%**
Hormonal products	431	
Homeopathic	252	
Botanical products	111	
Energy products	75	
Antimicrobials	**884**	**2.1%**
Antibiotics	627	
Antifungals	158	
Antivirals	46	



	<1	1	2	3	4	5	6-12y	13-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	>90
Male	1,163	3,434	3,248	1,493	754	424	1,177	991	1,136	799	573	513	341	202	104	18
Female	1,074	3,191	3,005	1,261	550	332	865	1,566	1,341	1,051	804	741	501	301	195	32

Nebraska Risk and Protective Factor Student Survey
Results for 2014

Profile Report:
State of Nebraska

Sponsored by:
Nebraska Department of Health and Human Services
Division of Behavioral Health

Administered by:
Bureau of Sociological Research
University of Nebraska-Lincoln

NRPFSS is part of the Student Health and Risk Prevention (SHARP) Surveillance System that administers surveys to youth enrolled in Nebraska schools

Table 5.1. Youth at Risk

Risk Indicators	Problem Behaviors: Substance Abuse	Delinquency	Teen Pregnancy	School Drop-Out	Violence
Community					
Availability of drugs and firearms	✓	✓			✓
Community laws and norms favorable toward drug use, firearms, and crime	✓	✓			✓
Media portrayals of violence					✓
Transitions and mobility	✓	✓		✓	
Low neighborhood attachment and community disorganization	✓	✓			✓
Extreme economic and social deprivation	✓	✓	✓	✓	✓
Family					
Family history of the problem behavior	✓	✓	✓	✓	✓
Family management problems	✓	✓	✓	✓	✓
Family conflict	✓	✓	✓	✓	✓
Favorable parental attitudes and involvement in the problem behavior	✓	✓			✓
School					
Academic failure in elementary school	✓	✓	✓	✓	✓
Lack of commitment to school	✓	✓	✓	✓	✓
Peer / Individual					
Early and persistent antisocial behavior	✓	✓	✓	✓	✓
Alienation and rebelliousness	✓	✓		✓	
Friends who use drugs and engage in a problem behavior	✓	✓	✓	✓	✓
Gang involvement	✓	✓			✓
Favorable attitudes toward drug use and other problem behaviors	✓	✓	✓	✓	
Early initiation of the problem behavior	✓	✓	✓	✓	✓
Constitutional factors	✓	✓			✓

Table 5.1 illustrates associations found between 19 selected risk factors and 5 problem behaviors. Check marks indicate where at least two well-designed, published research studies have shown a link between the risk factor and the problem behavior.

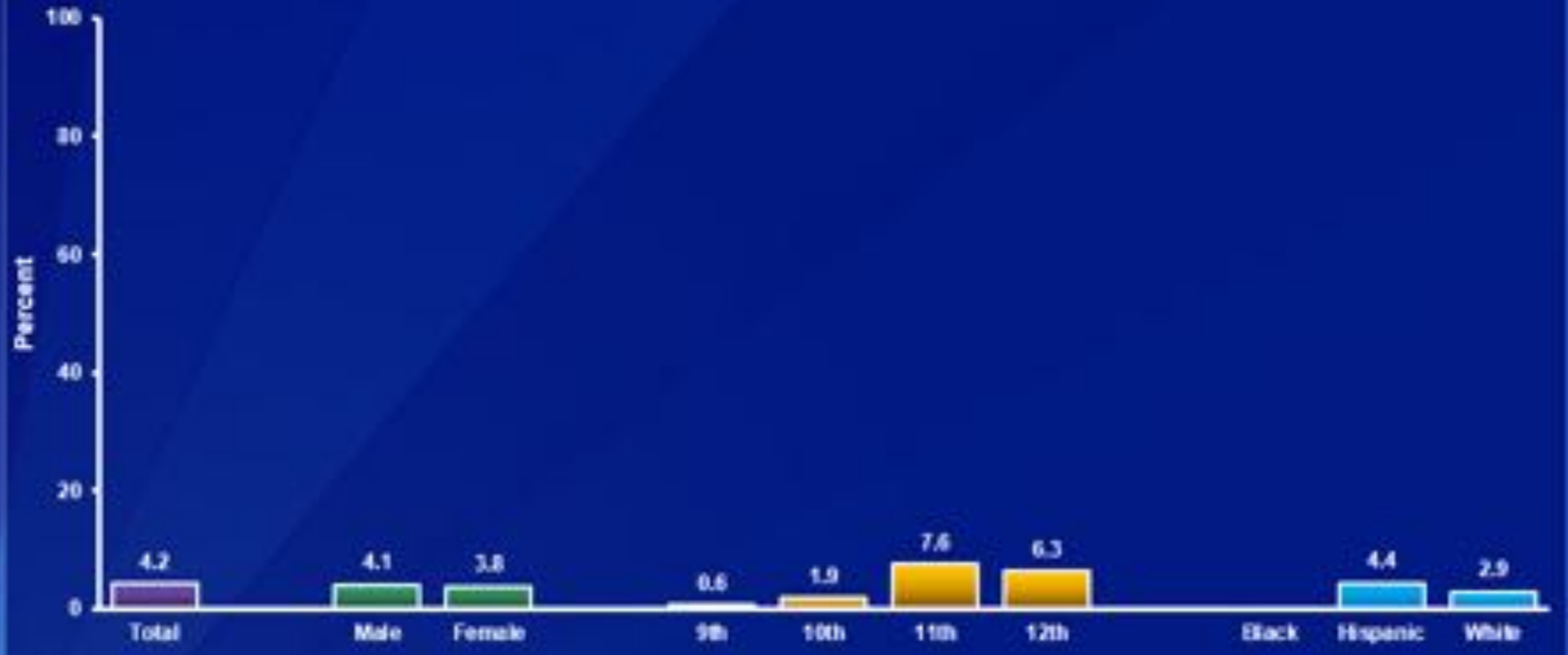
Community	8th Grade	10th Grade	12th Grade
Risk Factors	State	State	State
Community Disorganization	35.0%	42.3%	42.9%
Laws and Norms Favorable to Drug Use	35.8%	40.0%	52.3%
Perceived Availability of Drugs	20.4%	22.4%	27.6%
Perceived Availability of Handguns	34.5%	25.3%	29.7%
Protective Factors			
Opportunities for Prosocial Involvement	91.5%	90.3%	92.1%
Family	8th Grade	10th Grade	12th Grade
Risk Factors	State	State	State
Poor Family Management	27.4%	26.6%	27.3%
Parental Attitudes Favorable Toward Drug Use	24.7%	39.3%	41.4%
Protective Factors			
Attachment	64.8%	62.9%	61.6%
Opportunities for Prosocial Involvement	74.1%	65.8%	64.1%
School	8th Grade	10th Grade	12th Grade
Risk Factors	State	State	State
Academic Failure	30.0%	35.0%	35.3%
Low Commitment to School	36.4%	36.8%	37.3%
Protective Factors			
Opportunities for Prosocial Involvement	77.3%	73.1%	74.8%
Rewards for Prosocial Involvement	61.5%	65.6%	54.6%
Peer / Individual	8th Grade	10th Grade	12th Grade
Risk Factors	State	State	State
Early Initiation of Drug Use	16.4%	19.6%	26.4%
Early Initiation of Antisocial Behavior	21.4%	22.9%	23.5%
Favorable Attitudes Toward Antisocial Behavior	22.6%	31.4%	33.6%
Favorable Attitudes Toward Drug Use	20.5%	34.2%	40.2%
Perceived Risks of Drug Use	37.1%	50.8%	48.7%
Gang Involvement	3.3%	3.5%	2.9%
Protective Factors			
Belief in the Moral Order	81.8%	70.4%	66.0%
Peer-Individual Prosocial Involvement	66.3%	72.5%	72.6%

The **2014 risk and protective scores for the State of Nebraska are displayed by grade**. The scores for the risk factors indicate the proportion of students that are at risk in this area. Conversely, the protective factor scores represent the proportion of students that have this protective buffer in their lives.

Table 3. Lifetime Drug Trends among Nebraska High School Students, 1991-2015

	1991	1993	2003	2005	2011	2013	2015
Marijuana	22.3%	19.3%	34.6%	32.3%	25.0%	23.6%	26.6%
Cocaine/Crack	4.6%	3.5%	6.9%	7.5%	4.2%	3.2%	5.3%
Inhalants	--	--	11.7%	11.3%	9.7%	7.0%	8.1%
Heroin	--	--	2.7%	2.7%	1.9%	1.2%	2.5%
Meth	--	--	6.3%	5.8%	2.7%	2.0%	4.2%
Ecstasy	--	--	5.0%	4.9%	4.5%	3.2%	5.1%
Steroids	2.4%	3.0%	3.6%	4.0%	2.8%	2.3%	3.5%
Prescription Drugs	--	--	--	--	12.4%	10.4%	13.5%

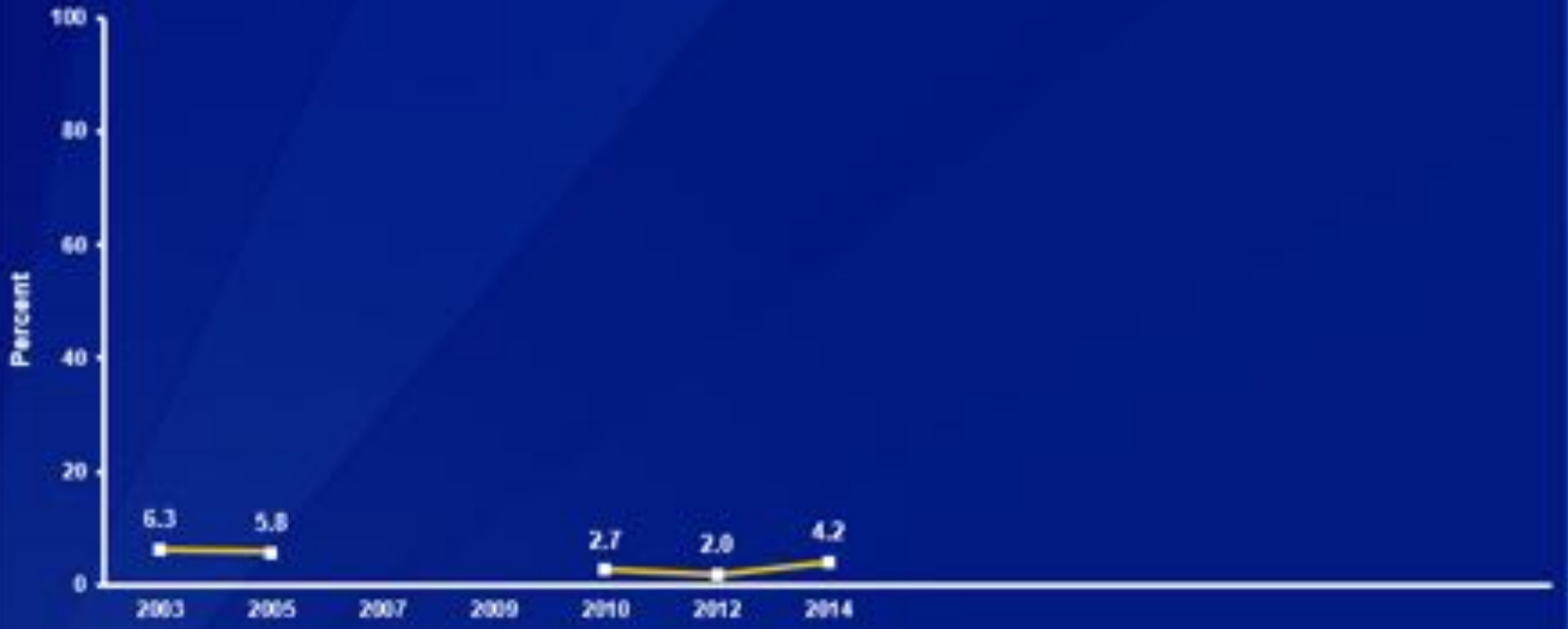
Percentage of High School Students Who Ever Used Methamphetamines,* by Sex, Grade,† and Race/Ethnicity, 2014



*Also called "speed," "crystal," "crank," or "ice," one or more times during their life
†11th > 9th, 11th > 10th, 12th > 9th, 12th > 10th (Based on t-test analysis, $p < 0.05$.)
All Hispanic students are included in the Hispanic category. All other races are non-Hispanic.
Missing bar indicates fewer than 100 students in this subgroup.
Note: This graph contains weighted results.

Nebraska - YRBS, 2014 - QN53

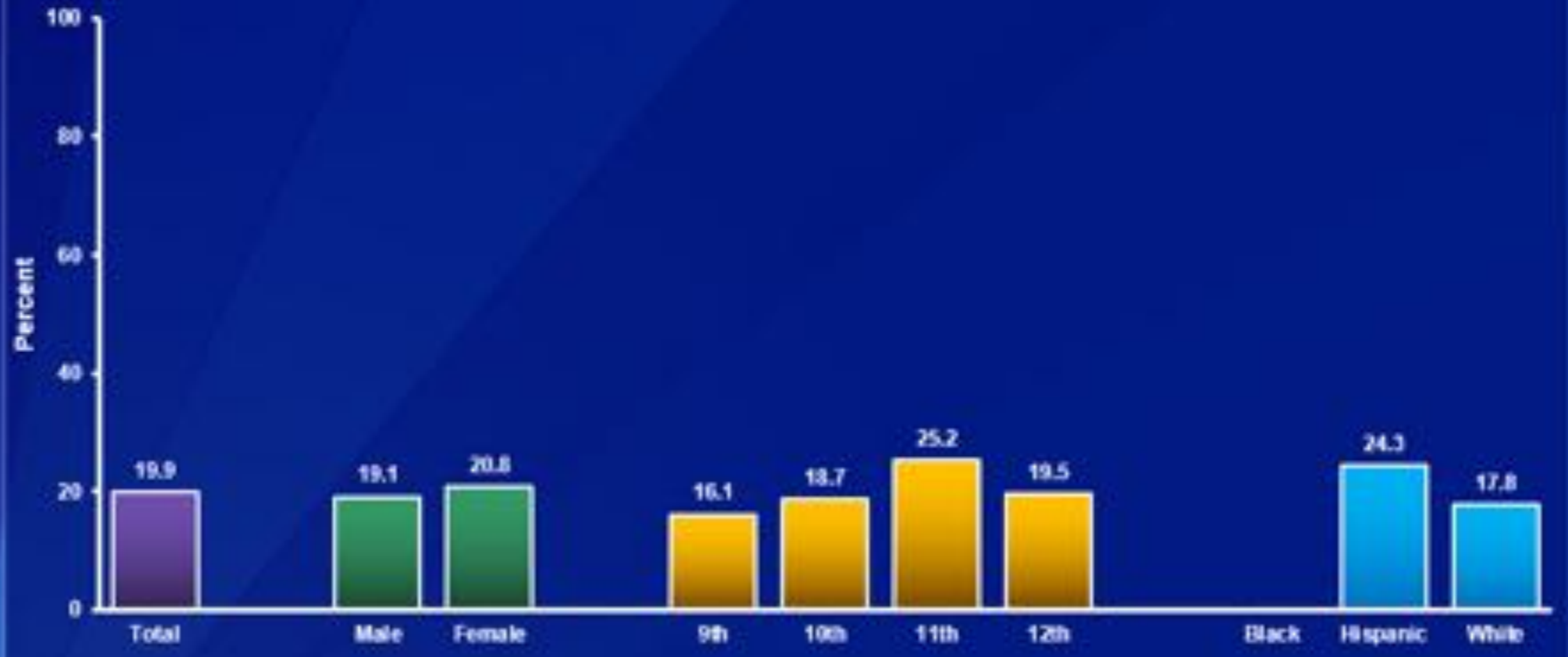
Percentage of High School Students Who Ever Used Methamphetamines,* 2003-2015†



*Also called "speed," "crystal," "crank," or "ice," one or more times during their life
†Decreased 2003-2014 [Based on linear and quadratic trend analyses using logistic regression models controlling for sex, race/ethnicity, and grade ($p < 0.05$). Significant linear trends (if present) across all available years are described first followed by linear changes in each segment of significant quadratic trends (if present).]
Question not included in the survey in 2007,2009.
Note: This graph contains weighted results.

Nebraska - YRBS, 2003-2015 - QN53

Percentage of High School Students Who Were Offered, Sold, or Given an Illegal Drug on School Property,* by Sex, Grade,† and Race/Ethnicity,† 2014



*During the 12 months before the survey
†11th > 9th; H > W (Based on t-test analysis, $p < 0.05$.)
All Hispanic students are included in the Hispanic category. All other races are non-Hispanic.
Missing bar indicates fewer than 100 students in this subgroup.
Note: This graph contains weighted results.

Nebraska - YRBS, 2014 - QN59

Protecting Children

Children's Environmental Health and Disease Prevention Research Centers

- The centers connect basic scientists, behavioral scientists, social scientists, pediatricians and other clinicians, and public health professionals, who work together to improve the health and environments of children.
- The centers apply community-based, participatory research techniques in which community organization partners play a vital role in informing, implementing, and sharing what the findings mean.
- Each center has a designated physician scientist to ensure research is translated into practical information for health care providers.
- Contributions from this unique national network of research centers lead to long-term economic and social benefits along with improved health.

Funding – National Institutes of Health and the U.S. Dept. of Health & Human Services

Children's Environmental Health and Disease Prevention Research Centers

How can I reduce my child's exposure to PAHs?

It is difficult to avoid exposure to PAHs since they are found throughout the environment. However, you can significantly reduce your child's exposure by avoiding certain areas and by modifying some home and recreational activities.

- Avoid smoke from wood fires, whether from home heating or for recreational purposes.
- Avoid exposure to automobile exhaust and areas of high traffic congestion.
- Avoid areas where asphalt road construction or tar roofing is occurring.
- If you smoke, smoke outdoors and in areas away from children. Avoid areas where your child may be exposed to secondhand smoke.
- Prepare foods by slower cooking over low heat, rather than by charring or food.
- Avoid skin contact with soot.

How can I protect my child from exposure to lead and mercury?

- Dust areas in your home regularly. Wet wash window wells, sills, and floors.
- If you smoke, smoke outdoors away from children and avoid areas where your child may be exposed to secondhand smoke.
- Wash your child's hands with soap and water before eating, naps, and bedtime.
- Wash bottles, teething rings, and toys with soap and water.
- Don't let your child eat or chew on anything that may have lead paint on it. Look for teeth marks on the woodwork in your home.
- Take your shoes off at the door so that soil and dust are not tracked into the house.
- Make sure that your child has a balanced diet that includes enough calcium, iron, protein, and zinc. Nutritional deficiencies can increase the absorption and the effects of exposure to harmful metals.
- Use care when handling and disposing of thermometers, batteries, and other consumer products that contain mercury, cadmium, or lead.
- If you have hobbies that involve welding, soldering, or ceramic or glass glazing, perform them outside the home or in a well-ventilated area away from children.
- Adults working in jobs where metals are used should shower and change clothes and shoes before coming home. This includes painters, remodelers, and workers in smelters, battery plants, radiator, or auto body shops.

How can I reduce my child's exposure to pesticides?

- Prevent pests from entering a building by closing or sealing openings.
- Eliminate sources of food and moisture so that the environment is not conducive to pests.
- Use physical means to control pests, such as fly swatters, whenever possible, but if you use pesticide products:
  - Try horticultural oils and diatomaceous earth or non-broadcast products such as baits or traps
  - Read and follow all label instructions, including the proper use of the product, the location for application, the quantity to be applied, the frequency of application, the method of application, and the time-delay prior to reentry of treated areas
  - Remove food, dishes, toys, and other objects before treating indoors
- Wash fruits and vegetables thoroughly before eating them.
- Avoid treated areas during and after treatment.
- Remove shoes at the door so that soil and dust are not tracked into the house.
- Ensure that pesticide products are stored in safe containers and in places where children do not have access to them.

Methamphetamine Exposure?

- Nebraska is one of only 11 states that has regulations (13 have guidelines) to help ensure that former methamphetamine laboratories, found in motels, rental properties, etc., are properly decontaminated so they are safe for occupation.
- These labs are discovered following a seizure by local, state, or federal law enforcement officers.
- Many labs go undetected and new tenants and property owners are made aware of the issue only after moving in and they are notified by neighbors.
- Please contact me if you want information on testing a property.

Thank you!

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